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DATA COLLECTION SYSTEM

5 The present invention relates to a system for the  
collection of data from remote locations, of particular  
application as a golf scoring system but by no means  
limited to this use.

10 Traditionally golfers record their score  
progressively on a card. Such scores may be recorded after  
the game of golf for later reference, such as for the  
calculation of handicaps and so on, by lodging the score  
card with a golf club or other authority. Such systems are  
time consuming for the golfer and golf club administrator,  
insecure, inconvenient if records of a large number of  
golfers and their score cards are to be accumulated  
15 centrally, and incapable of providing prompt and  
authoritative details to other golfers of correct handicaps  
or other statistical information.

20 It is an object of the present invention,  
therefore, to provide a data collection system that can at  
least reduce one or more of the above limitations.

Accordingly, the present invention provides a sport or game  
progress data collection system including:

25 an electronic central data collection means for  
accumulating, storing and manipulating data;

a plurality of data input means for entering  
sport or game progress data remotely, each of said data  
input means being provided with data indicative of its  
location; and

30 communications means for communicating between  
said data input means and said data collection means,  
whereby progress data may be entered by a person into any  
of said data input means and wherein progress data so  
entered is transmitted to said data collection means and  
35 said data indicative of said respective location of said  
respective data collection means.

Preferably said system is to transmit further  
data from said data collection means to one or more of said  
data input means.

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Preferably each of said data input means includes identification means for tagging any data entered into said data input means with a data tag.

5 Preferably said data collection means includes memory means for storing said data associated with said tag.

Preferably said tag indicates an identity of a person entering said data.

10 Preferably each of said data input means includes card reading means for reading a data card.

Thus, data may be entered from a card, or by a card as well as by other means.

Preferably said card stores said data tag.

15 Preferably each of said data input means includes card writing means, for storing data onto a card, whereby said stored data may be data transmitted from said data collection means.

20 Thus, after data is entered into the data input means and transmitted to the data collection means, it—or other data, such as data updated on the basis of the entered data—may be transmitted back to the data input means and stored onto the card.

Preferably said card writing means comprises a smart card writing means.

25 Preferably said card reading means comprises a smart card reading means.

30 Preferably each of said data input means is operable to associate any data entered into said data input means with a reference read by said smart card reading means from a smart card.

Preferably said reference corresponds to the identity of a person entering said data and in possession of said smart card.

35 Preferably said data comprises golf score data.

Thus, data—such as a golf score—may be entered into one of the data input means, but stored centrally. The data may be identified in the central location according to any desired criterion, but most preferably according to the person who has entered the data. This

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identity may be stored on a smart card, or any other suitable medium, or entered manually by that person.

Preferably each of said data input means includes a data entry terminal including a keyboard or keypad and  
5 visual display unit.

Thus, data may be entered by means of a keyboard or keypad, and a visual display can be provided to convey information to the person, or echo the data being entered.

Preferably each of said data input means includes  
10 a proximity sensing means to detect when a user approaches one of said data input means, so that portions of said system can automatically power up only when required by said user and to identify the location of said user or of said data input means.

Thus, this feature will reduce power demands.

Preferably said communication means includes a wireless communication means.

Thus, although communication may be means of  
20 cables between the data collection means and the data input means, where desirable communication can be wireless, with transmitters attached to each data input means (which may be mobile).

The present invention further provides a golf scoring system including:

25 a central score collection computer for accumulating, storing and manipulating golf scores;

a plurality of score input terminals for entering golf scores remotely, each of said terminals being provided with data indicative of its location; and

30 communications means for communicating between said terminals and said central computer, whereby said terminals are distributed around a golf course so that players may enter golf scores into said terminals, and said terminals may transmit said scores and said data indicative  
35 of said respective location of said respective terminal to said central computer, and said central computer is operable to store said scores and calculate cumulative scores and handicaps.

Preferably said communications means includes

radio communication means so that said terminals and said central computer can communicate wirelessly.

Preferably said communication means is a two way communication means so that said central computer can transit data including cumulative scores and/or handicaps to said terminals.

Preferably each of said terminals includes identification means for tagging each of said scores entered into said terminals with a corresponding data identity tag.

Preferably said central computer is operable to store said data identity tags associated with said scores.

Preferably each of said tags indicates an identity of a person entering the corresponding of said scores.

Preferably each of said terminals includes a smart card reader.

Thus, data may be entered from a smart card, or by a smart card as well as by other means.

Preferably each of said terminals includes a smart card writer, for storing data onto a smart card.

Preferably said system includes said smart card.

Preferably said stored data is data transmitted from said central computer, such as cumulative core data or handicap data.

Thus, after a score is entered into one of the terminals and transmitted to the central computer, it - or other data, such as data updated on the basis of the entered data - may be transmitted back to the terminal and stored onto the smart card.

Preferably each of said terminals is operable to associate any data entered into said terminal with a reference read by said smart card reader from said smart card.

Preferably said reference corresponds to the identity of a person entering said a score and in possession of said smart card.

Thus, a golf score may be entered remotely into one of the terminals, and stored centrally. The scores may

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be identified in the central computer according to any desired criterion, but most preferably according to the person who has entered the score. This identity may be stored on a smart card, or entered manually by that person.

5 Preferably each of said terminals includes a data entry terminal including a keyboard or keypad and visual display unit.

10 Preferably each of said terminals includes a proximity sensor to detect when a player approaches one of said terminals, so that portions of said system can automatically power up only when required by said player and to identify the location of said one of said terminals.

15 Preferably said central computer is connected to a computer network so that data stored on said central computer can be accessed remotely and/or said central computer can access golf data stored remotely.

Thus, handicap or score information may be shared with other clubs, or accessed by players from home or elsewhere.

20 The present invention still further provides a golf scoring system including:

a golf course with a club house;  
a central score collection computer for  
accumulating, storing and manipulating golf scores, located  
25 in said club house;

a plurality of score input terminals for  
distribution around said course for entering golf scores  
remotely; and

30 wireless communications means for communicating between said terminals and said central computer, whereby golf players may enter their scores progressively into said terminals and said terminals can transmit said scores and data indicative of the location of said respective terminal to said central computer, and said central computer is  
35 operable to store said scores and calculate cumulative scores and handicaps.

The present invention yet further provides a method for golf scoring including the steps of:

entering a score remotely into a score input

terminal;

transmitting said score and data indicative of  
the location of said terminal from said terminal to a  
central score collection computer for accumulating, storing  
and manipulating golf scores; and

storing said score on said central computer.

Preferably said method includes calculating a  
cumulative score by means of said central computer.

Preferably said method includes transmitting said  
cumulative score from said central computer to said input  
terminal.

Preferably said method includes calculating  
handicap data by means of said central computer.

Preferably said method includes transmitting said  
handicap data from said central computer to said terminal.

Preferably said method includes distributing a  
plurality of said input terminals on a golf course.

Preferably said method includes progressively  
entering said score after each hole of said golf course.

Preferably said method includes entering  
identification data into said input terminal associated  
with said score and storing said score and data calculated  
therefrom identified by means of said identification data.

Preferably said entering identification data  
includes reading said identification data from a smart  
card.

Preferably said method further includes storing  
said score on said smart card.

In order that the invention may be more clearly  
ascertained, preferred embodiments will now be described by  
way of example with reference to the accompanying drawings,  
in which:

Figure 1 is a schematic representation of a golf  
scoring system according to preferred embodiment of the  
present invention;

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Figure 2 is a further schematic representation of the golf scoring system of figure 1;

Figure 3 shows a micro-terminal according to the embodiment of figure 1;

5 Figure 4 shows a typical deployment of the micro-terminals of figure 3 according to the embodiment of figure 1;

10 Figure 5 shows an alternative deployment of a micro-terminal of figure 3 according to the embodiment of figure 1; and

Figure 6 shows a schematic representation of the configuration of the system of figure 1.

15 A golf scoring system according to a preferred embodiment of the present invention is represented schematically at 10 in figure 1. The system 10 includes a central data collection computer 12, located in the clubhouse 14, and multiple micro-terminals 16a,b,c, located on the golf course 18. The micro-terminals 16a,b,c communicate with  
20 the computer 12 by radio (not shown), and are generally located beside each tee (other than the first tee) of golf course 18 but may also - or instead - be located beside each green.

25 The system 10 is also connected to a local computer network 20, and hence to a handicapping database 22 (which will generally be located at the headquarters of the pertinent golf association). The handicapping database 22 may also include connection to an equivalent national and/or international handicapping databases 24 and 26  
30 respectively.

The network 20 is connected to the world wide web 28 so that users may inspect the computer 12 or database 22 remotely, including from a home computer 30 or elsewhere using a suitable internet service provider 32.

35 Information is read from and written to a smart card 34 by micro-terminals 16a,b,c. This enables the information to be read and written on the golf course 18,

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or home with home computer 30, or in the clubhouse 14.

A further view of the system 10 is shown generally in figure 2 at 36, in which a fuller representation of the interconnectivity of components of -  
5 and services provided by - the system are depicted.

A typical micro-terminal is shown generally at 40 in figure 3. Micro-terminal 40 includes a housing 42 shaped like a large golf ball (in keeping with the intended application of this embodiment, and to make the micro-  
10 terminal 40 readily identifiable), to house the electronics. A visual display unit 44 is provided to display information, and a keypad 46 to input information. A smart card reader/writer 48 allows a user to enter information stored on a smart card (such as identity or  
15 membership information), and to store or update information on the card. It will be appreciated that the system could employ any other type of card (and suitable reader/writer) or indeed a universal card reader/writer with which a variety of cards may be used.

20 The housing 42 is mounted on a stand 50 in the shape of a golf-tee.

The micro-terminal 40 also includes a proximity sensor 52 to detect when a player approaches and requires service, in order to reduce power demand.

25 The visual display unit 44 provides feedback of the player's input information (such as cumulative score or handicap) and creates the platform for interactive services with the clubhouse and other service providers.

A speaker 54a and microphone 54b are provided,  
30 and constitute an intercom to facilitate intercom functions and allow a player to communicate directly with the clubhouse (14 in figure 1).

The keypad 46 provides a means for entering stroke information into the system 10 and adds  
35 functionality by way of request buttons; these buttons may include, for example, a switch for the intercom 54a,b and a switch to activate a buzzer in clubhouse 14 (to call for

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drinks or assistance).

Rechargeable batteries that are housed in the stand 50 power the micro-terminal 40. The housing 42 may be provided with solar panels to recharge or augment the batteries.

The micro-terminal 40 includes a radio (not shown) with antenna 56 for communication with the central computer (12 in figure 1) at clubhouse 14. The radio provides an efficient and direct transmission path between player and clubhouse 14. Radio transmission is preferred, as it eliminates the expense of laying cables or erecting overhead cabling (both of which are especially undesirable on a golf course), but it will be understood that where appropriate the micro-terminal 40 could communicate with the clubhouse via landline.

The card reader/writer 48 will preferably read a smart card (having a microchip embedded in the card), but cards with a magnetic stripe on the rear, or both a magnetic stripe and a microchip are also suitable. The card reader/writer unit may take the card inside the unit to process contact cards or may accept the card externally to process contactless cards.

A telephone handset 58 delivers all telephony functions.

A video camera 60 is mounted on the micro-terminal 40 to monitor the surrounding environment. The video camera 60 may be controlled from the clubhouse 14, and swivelled to provide a 360° field of view.

In practice, each player receives a smart card before commencement of the game of golf. These cards are issued at the clubhouse 14 on the day or before the game by other organisations. Partner organisations, such as financial institutions, may issue the smart cards in association with credit agencies or loyalty programs. Each player's pertinent details are stored on the smart card. This information uniquely identifies the cardholder. Golf club members receive smart cards on a permanent basis while

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guests receive similar smart cards on a "pay-per-play" basis.

At the start of the game the players complete their play at the first hole and move to the second hole.  
5 There is no micro-terminal at the tee-off point of the first hole.

As the players approach the tee-off point of the second hole the micro-terminal 40, via the proximity sensor 52, detects the player's presence and activates the  
10 terminal 40 in readiness for the player transaction. Players take it in turn to insert their smart card into the micro-terminal's card reader/writer slot 48. The micro-terminal 40 instructs players to enter the number of strokes for the previous hole by means of a suitable  
15 message or series of messages displayed on screen 44, or a recorded message played over speaker 54a. The smart card indicates the player's preferred language, and the recorded message is played in that language if available. The player types in the number of strokes for the previous  
20 hole. The smart card is then removed from the slot 48. The next player repeats the process until all players input the number of strokes taken in the previous hole. The information so entered may be stored simply on the smart card, transmitted to the computer 12 in clubhouse 14, or  
25 both. As the game progresses, the players complete their play at each hole and move to the tee-off point of the next hole where other micro-terminals are located.

A view of a typical golf course provided with the micro-terminals of the present embodiment is shown in  
30 figure 4.

A location number identifies each micro-terminal during installation. At the tee-off point of the 9th hole the associated micro-terminal is identified as terminal number 8. The players at the tee-off point of the 9th hole  
35 will be inputting number of strokes for the 8th hole. By this method of identification, the player is not required to enter the hole location number, as it is entered

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automatically for them by the terminal. Should the players fail to input their score at the next tee-off point the micro-terminal identifies that no score exists for the previous hole. The micro-terminal guides the player through the process of inputting the appropriate scores for the corresponding hole.

Similarly, a variation of the on-course micro-terminal will be available as an attachment to a golf cart 62 (as illustrated in figure 5). This terminal 64, permanently fixed to the cart 62, has comparable functionality to the on-course micro-terminal.

Once the player completes all holes, the smart card is inserted into the clubhouse kiosk. The kiosk verifies the player's identity and the number of strokes for each hole. The score, together with the player information, is submitted to the National Handicapping Database 24. This Database holds all national handicapping records.

In the preferred embodiment, the clubhouse kiosk also prints a score sheet for the player, prints current handicapping information, issues a personalised smart card to members and guests, acts as a communication booth for Internet connectivity and e-mail communication.

Optionally, the smart card may be contactless, so that the player leaves the card in his or her pocket (or displays the card on golf cart or bag) and - as he or she approaches the micro-terminal - the card reader identifies the presence of a card and automatically reads the player ID. The player then inputs the number of strokes and continues with the game.

Alternatively, the player ID and the number of strokes may be entered manually directly into the micro-terminal, and all data is stored on the central computer 12 in the clubhouse 14.

The micro-terminal may also provide various on-course service for the players. Should an accident or an emergency arise on the course (or for any other reason) the

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request can respond accordingly.

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Providing this service has the added benefit in

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keeping the player at the clubhouse longer and as such represents a merchandising/retail opportunity.

Handicapping information, presented in numerous graphic methods, can also be printed out as a permanent  
5 record of results.

The kiosk becomes the network interface device with the National Handicapping Database. The score data from the smart card is verified, handicap calculations performed and then submitted to the National Database for  
10 storage.

The kiosk is also Internet ready. A player has the ability to not only search the world wide web for golf information but also to send e-mail.

Players can utilise the kiosk to instantly  
15 acquire a personalised smart card prior to their game. After entering the player's details into an online electronic form the kiosk communicates with the National Handicapping Database System to activate the identification and registry process. The kiosk has a built-in electronic  
20 camera, card personalisation and smart card activation equipment. It can take a photo of the player, process the digital image internally, print the player's image on the card, print the golf club logo on the card and then initialise the smart card. The card is then dispensed to  
25 the player in readiness for the automatic scoring process.

The clubhouse kiosk thus acts as an unattended card issuing station.

Figure 6 is a view of the system configuration 70 of the system 10 according to the present invention in  
30 conjunction with golf course and player.

Thus, the system 10 automates golf scoring and increasing its efficiency, and integrates scoring with other systems, networks and facilities. Golf players thereby have more time to concentrate on and enjoy the game  
35 rather than spend time manually writing their golf score on a sheet of paper with a pencil. Their score will also be electronically stored and their handicap automatically

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calculated. Further, the clubhouse has a direct connection and communication path with players on the golf course.

Other applications of this system (or variations thereof) include: 1) Various other games; for example, Mini Golf, in which the micro-terminal is adapted as a mini-terminal for Mini Golf. The unit would function in the same manner as the on-course terminal and used to automate the scoring process; 2) Security: a modified micro-terminal can be placed in remote areas or sites where security guards log-on at specific times. A central system monitors transactions; 3) Car rallies: the micro-terminal can be adapted to suit situations where multi-stations and time dependent outcomes are criteria. In car rallies, the smart card is inserted into the micro-terminal that is situated at each terminus. Transmission of race time, speed and other vital information is transmitted to a central database via a wireless communication link. The central monitoring system performs data calculations and displays these in numerous formats. The rally cars are also fitted with a mobile micro-terminal where performance and progress are monitored; 4) Trade shows: the micro-terminal can be used as a data-logging device at trade shows. The smart card is inserted into the terminal and loaded with trade stand information. Similarly, the terminal could download trade show participant information from the card; or 5) Financial reload terminals: the micro-terminal can be placed in any street corner and act as a financial reload terminal. In this case, the customer inserts their smart card into the terminal and requests money to be downloaded into the card. The micro-terminal wirelessly (or otherwise) communicates with the financial institution, or financial clearing house, for authorisation and action.

Modifications within the spirit and scope of the invention may readily be effected by persons skilled in the art. It is to be understood, therefore, that this invention is not limited to the particular embodiments described by way of example hereinabove.